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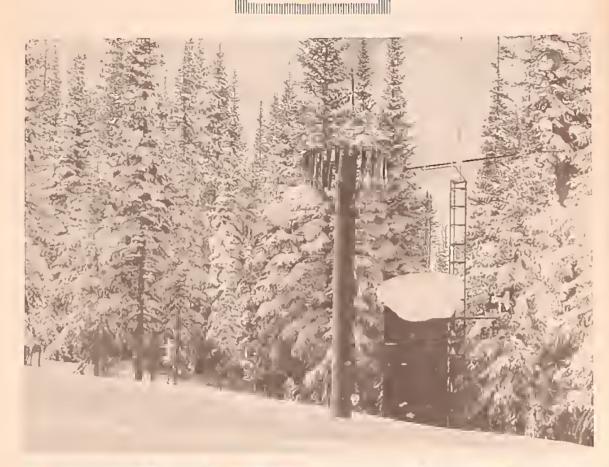


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WATER SUPPLY OUTLOOK FOR COLORADO AND NEW MEXICO

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

APRIL 1, 1979



U.S. DEPARTMENT of AGRICULTURE * SOIL CONSERVATION SERVICE

Collaborating with
COLORADO STATE UNIVERSITY EXPERIMENT STATION
STATE ENGINEER of COLORADO
and STATE ENGINEER of NEW MEXICO

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Report prepared by

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SATELLITES AID IN FORECASTING

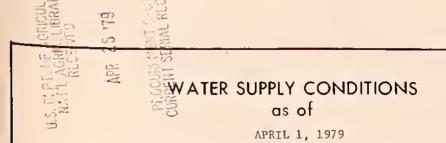
HYDROLOGISTS AND ENGINEERS HAVE WANTED AN ECONOMICAL AND TIMELY METHOD OF MONITORING THE AREAL EXTENT OF THE SNOWPACK FOR A LONG TIME. AERIAL PHOTOGRAPHY TAKEN FROM LOW FLYING AIRCRAFT ON A REPETITIVE BASIS WAS PROHIBITIVE DUE TO THE LENGTH OF TIME AND COST INVOLVED. HOWEVER, WITH THE LAUNCHING OF THE LANDSAT SERIES SATELLITES IN THE EARLY 1970'S A NEW SOURCE OF IMAGERY BECAME AVAILABLE FOR USE IN DETERMINING SNOW COVERED AREA. LANDSAT SATELLITES CURRENTLY TAKE A PICTURE OF THE SAME SPOT ON THE EARTH'S SURFACE EVERY NINE DAYS. SPATIAL RESOLUTION OF THE IMAGERY IS 100 METERS WHICH MAKES IT SUITABLE FOR MAPPING THE SNOW LINE ON WATERSHEDS AS SMALL AS 100 SQUARE MILES.

LANDSAT SNOW COVER MAPPING HAS BEEN PERFORMED BY THE SOIL CONSERVATION
SERVICE FOR THE PAST SIX YEARS IN SIX WATERSHEDS IN THE RIO GRANDE AND ARKANSAS
RIVER BASINS TO DETERMINE THE USEFULNESS OF THE INFORMATION IN IMPROVING FORE—
CAST ACCURACY. THIS INVESTIGATION WAS A COOPERATIVE EFFORT WITH THE COLORADO
STATE ENGINEER AND NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA). RESULTS
TO DATE INDICATE THAT COMBINING SATELLITE DERIVED BASIN SNOW COVER WITH SNOW
COURSE AND SNOTEL DATA WILL IMPROVE FORECAST ACCURACY BY AS MUCH AS TEN PERCENT.
UNFORTUNATELY, SATELLITE IMAGERY TAKES SEVERAL WEEKS FOR PROCESSING AT NASA
BEFORE IT IS AVAILABLE FOR USE IN FORECASTING. IF THIS HURDLE CAN BE OVERCOME A
NEW TOOL WILL BE A REALITY FOR THE OPERATIONAL FORECASTER. WHEN BOTH THE WATER
CONTENT OF THE SNOWPACK AND ITS AREAL EXTENT ARE KNOWN WITH MORE CERTAINTY A
REDUCTION IN PROCEDURAL FORECAST ERROR IS TO BE EXPECTED.

"The Conservation of Water begins with the Snow Survey"

UNITED STATES DEPARTMENT OF AGRICULTI
SOIL COUSERVATION SERVICE
SAOW SURVEY UNIT
P.O. BOX T7107
OENVER, COLORADO 80217
OUKGA BRIDIALS





EXCELLENT WATER SUPPLIES ARE ANTICIPATED IN BOTH COLORADO AND NEW MEXICO FOR
THE COMING IRRIGATION SEASON. MARCH CONTINUED THE PATTERN OF ABOVE NORMAL
PRECIPITATION FOR SOUTHERN COLORADO AND NEW MEXICO WHICH HAS DOMINATED
THROUGHOUT THE WINTER. MAXIMUM OR NEAR MAXIMUM RECORD SNOWPACKS, PARTICULARLY
AT LOW ELEVATIONS, ARE THE RULE THROUGHOUT THIS REGION. STORMS THE LAST WEEK
OF MARCH AND FIRST WEEK OF APRIL BROUGHT ABUNDANT MOISTURE TO THE COLORADO
FRONT RANGE AND EASTERN PLAINS. THROUGHOUT THE STATE AS A WHOLE SOIL MOISTURE
IS RATED AS GOOD AND RESERVOIR STORAGE IS 85 PERCENT OF AVERAGE.

COLORADO -- ALL STREAMS IN THE STATE ARE PREDICTED TO FLOW ABOVE

AVERAGE DURING SPRING AND SUMMER RUNOFF. HEAVY PRECIPITATION ALONG

THE FRONT RANGE INCREASED THE SNOWPACK SUBSTANTIALLY ABOVE THE PREVIOUS MONTH'S

READINGS. SOUTHWESTERN COLORADO RECEIVED ABOVE NORMAL PRECIPITATION AGAIN

DURING MARCH. FLOWS IN THIS PART OF THE STATE ARE EXPECTED TO BE FROM 175 TO

200 PERCENT OF AVERAGE. FLOOD POTENTIAL REMAINS HIGH IN THE SOUTHWEST DUE TO

THE HEAVY LOW ELEVATION SNOWPACK.

NEW MEXICO -- HEAVY PRECIPITATION DURING MARCH IN NORTHERN NEW MEXICO

AUGMENTED THE ALREADY RECORD SNOWPACK. ALL STREAMS ARE FORECAST TO

FLOW AT ABOUT TWICE THEIR NORMAL AMOUNTS. VERY LITTLE MELT OCCURRED DURING

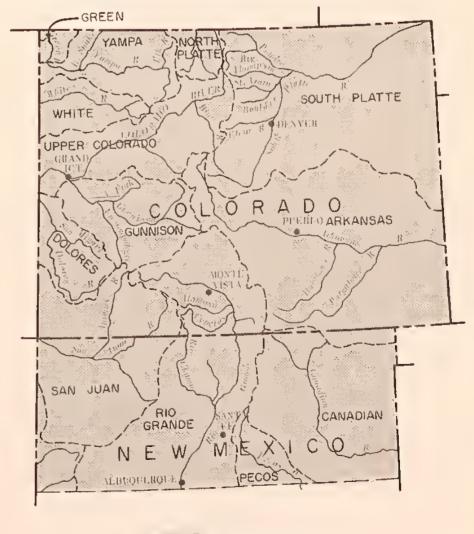
MARCH AT LOW AND MID-ELEVATIONS. AT HIGH ELEVATIONS THE SNOWPACK INCREASED.

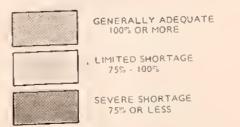
MOST OF THE SNOWPACK REMAINS INTACT AND WILL CONTRIBUTE MORE THAN NORMAL WHEN

RUNOFF BEGINS. GOOD ANTECEDENT MOISTURE CONDITIONS LAST FALL AND ABOVE NORMAL

PRECIPITATION AT HIGH ELEVATIONS IN MARCH SET THE STAGE FOR EXTREMELY HEAVY

BUNOFF VOLUMES DURING THE MAIN MELT PERIOD OF APRIL THROUGH JULY.



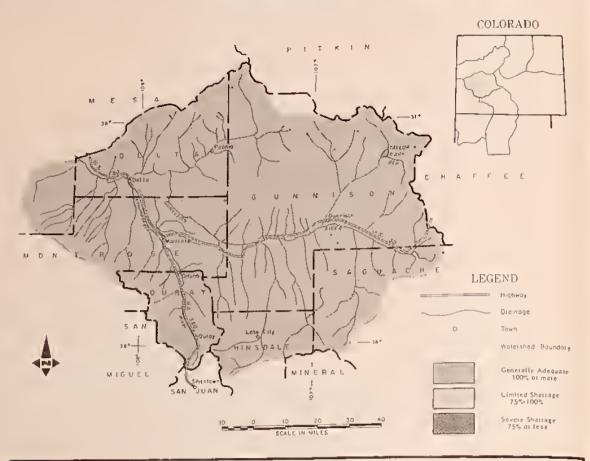




The map on this page indicates the most probable water supply as of the date of this report. Estimates assume average conditions of snow fall, precipitation and other factors from this date to the end of the lore—cast period. As the season progresses accuracy of estimates improve. In addition to expected streamflow, reservoir storage, soil moisture in irrigated areas, and other factors are considered in estimating water supply. Estimates apply to irrigated areas along the main streams and may not indicate conditions on small tributaries.



GUNNISON RIVER WATERSHED IN COLORADO



YOUR WATER SUPPLY

SNOWPACK PERCENTAGES DROPPED SLIGHTLY ON THE GUNNISON RIVER AND SURFAGE CREEK WATERSHEDS FOR THE SECOND MONTH. THE GUNNISON DECLINED FROM 155 TO 147 PERCENT OF NORMAL. SURFACE CREEK WENT FROM 153 TO 143 PERCENT OF NORMAL. THE UNCOMPANGRE WATERSHED, DUE TO THE STORMS OCCURRING ON OR ABOUT MARCH 20 AND 21, INCREASED SNOWPACK FROM 132 TO 145 PERCENT OF NORMAL. STREAMFLOW FORECASTS STILL REMAIN WELL ABOVE NORMAL AND COMPARABLE TO 1973 FLOWS. SOIL MOISTURE CONDITIONS ARE FAIR TO GOOD AND RESERVOIR STORAGE IS NEAR AVERAGE.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Gunnison River inflow to Blue Mesa Reservoir (1) Gunnison River near Grand Junction (2) North Fork of Gunnison (3) Surface Creek near Cedaredge Uncompangre River at Colona	1200	159	754.0
	2100	183	1150.0
	380	145	262.0
	22	145	15.2
	190	147	129.0

11) Observed flow plus change in storage in Toylor Reservoire. [2] Observed flow plus change in storage in Blue Wesa, Worses Point and Toylor Reservoire.
(3) Observed flow plus shange in storage in Poonso Reservoire.

WATER SUPPLY OUTLOOK Collent With Respect to Usual Supply

	FIDW PEIIOG				
STREAM OF AREA	Spring Searon	Late			
Ohio Creek Slate River Taylor River Tomichi Creek	Exc. Exc. Exc. Exc.	Exc. Exc. Exc. Exc.			

RESERVOIR STORAGE (Thousand A	c. Ft.)	END OF	ноитн
Daniel de France				

Batin be Stream	Urable	Usabli Sloiage			
RESERVOIR	Capacily	Tloot, Teao	V 111 7 e a 1	191,3-77 A+conge	
Blue Mesa Morrow Point Taylor	830 121 106	315 115 56	243 115 29	328 104 63	

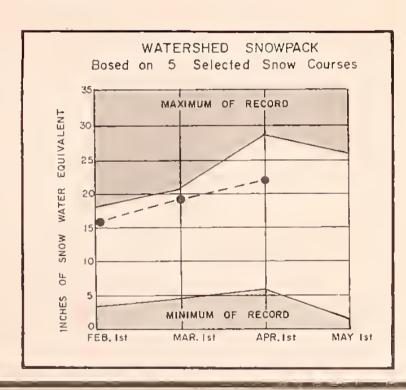
SUMMARY of SNOW MEASUREMENTS

RIVER BASIN	Number at Courter	THIS YE	AR'S SNOW PERCENT OF
SUB-WATERSHED	Avelaged	Latt Year	1963-77 Aviiage
Gunnison Surface Creek Uncompahgre	13 3 3	103 86 100	147 143 145

SHOW COURSE MEASUREMENTS

	CURR	ENT INFORM	MITTON	PAST RE	CORD
SNOW COURSE	DATE OF SURVEY	SHOW DEPTH UNCHEST	WATER CONTENT LINCHEST	WATER CO	E \$1
		(1	YEAR	AVG. 63-72
GUNNISON BASIN Gunnison River					
Alexander Lake Blue Mesa Butte Cochetopa Pass (B) Crested Butte Keystone Lake City Mesa Lakes (B) McClure Pass Park Cone Park Reservoir Porphyry Creek Tomichi	3/28 3/29 3/26 3/26 3/26 3/28 3/26 3/27 3/29 3/28 3/28	65 38 58 80 46 67 58 54	11.0 22.6 9.6 21.7 30.9 10.7 22.2 21.8 15.2 34.1	30.0 7.8 26.0 18.2 12.7 37.5 22.1	7.1 15.1 5.9 13.2 19.4 7.2 16.5 15.4 10.1 22.5
Surface Creek Alexander Lake Mesa Lakes Park Reservoir Uncompangre River Ironton Park Red Mountain Pass Telluride (B)	3/28 3/26 3/28 3/28 3/26 3/28	67 103 54	22.2 34.1 15.7 44.0	36.4 26.0 37.5 20.4 39.2 13.2	16.5 22.5

NS-No survey. (8)-In adjacent drainage.



LIST OF COOPERATORS

The following organizations cooperate in snow surveys for the Colorado, Platte, Arkansas and Rio Grande watersheds. Mony ather organizations and individuals furnish volumble information for the snow survey reports. Their cooperation is gratefully acknowledged.

Colorodo State Engineer Colorodo State Soil Conservation 8oard New Mexico State Engineer
Colorado State University Experiment Stotion
Rocky Mountain Forest and Ronge Experiment Stotion
New Mexico Dept. of Game and Fish

Department of Agriculture Forest Service Soil Conservation Service Department of Interior Bureau of Reclomation Geological Survey National Park Service Department of Commerce
NOAA, Notional Weather Service Defense Department Army Engineer Corps
Notional Aeronautics and Space Administration
Gaddard Space Flight Center

INVESTOR OWNED UTILITIES Colorada Public Service Company Public Service Compony of New Mexico

MUNICIPALITIES City of Denver City of Soulder

City of Greeley City of Fort Collins

WATER USERS ORGANIZATIONS Arkonsas Valley Ditch Association

Colorado River Woter Conservation District

IRRIGATION PROJECTS Formers Reservoir and Irrigation Company San Luis Valley Irrigotion District Sonta Mario Reservoir Company Costillo Land Company
Uncampohgre Valley Water Users' Association
Twin Lakes Reservoir and Canal Company Trinchera Irrigation Co.

CORPORATIONS
Aspen Skiing Corp.
Colorado Fuel and Iron Corp. Climox Molybdenum Corp. Copper Mountain Ski Area Lake Eldora Corp. Vail Associates, Incorporated Vermejo Park Corp. (NM) Toylor Lumber and Land Company Idarada Mining Corp.

PRIVATE CITIZENS Otto Goemmer, Colorado Marena Ranch, New Mexico

COLORADO RIVER WATERSHED IN COLORADO



YOUR WATER SUPPLY

THE MONTH OF MARCH BROUGHT INCREASES IN THE SNOWPACK IN MOST OF THE COLORADO DRAINAGE. SNOW ACCUMULATIONS NOW RANGE FROM 114 PERCENT OF NORMAL ON THE BLUE RIVER TO 149 PERCENT ON WILLOW CREEK, AS COMPARED TO LAST MONTH'S MEASUREMENTS OF 110 AND 140 PERGENT, RESPECTIVELY. STREAMFLOW FORECASTS FOR THIS MONTH SHOW A SLIGHT INCREASE OVER THE MARCH 1 FORECASTS. FLOWS SHOULD RANGE FROM 105 PERCENT TO 135 PERCENT OF NORMAL. RESERVOIR STORAGE HAS INCREASED SUBSTANTIALLY OVER LAST YEAR AND WITH GOOD SOIL MOISTURE CONDITIONS WATER SUPPLIES SHOULD BE AMPLE.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Blue River inflow to Dillon Reservoir Blue River inflow to Green Mountain Reservoir (1) Colorado River near Cameo (2) Colorado River near Dotsero (3) Colorado River inflow to Granby Reservoir (4) Roaring Fork at Glenwood Springs (5) Williams Fork near Parshall (6) Willow Creek inflow to Willow Creek Reservoir Eagle River below Gypsum	175 315 3150 1780 275 900 70 65 390	105 110 135 125 126 129 119 135	167.0 287.0 2336.0 1422.0 218.0 697.0 59.0 48.0 298.0

RESERVOIR STORAGE (Thousand Ac. Ft.) ENGINE MONTH

Basin of Stream	Urable	l.	(e	
RESERVOIR	Сирасии	16 ee Yeae	L mil Leat	196-J-77 A-116ge
Dillon	251	159	111	199
Granby	466	93	23	220
Green Mountain	139	55	40	56
Homestake	43	20	0	16
Ruedi	101	59	65	59
Vega	32	1.1		12
Williams Fork	97	43	26	33
Willow Creek	9	7	6	7

ATER SUPPLY OUTLOOK	€ «pro	rssed at "Poor F rnt" Wroth Respect	to Utual Supply
		Flow P	eerod
STREAM OF AREA		Spong Season	Z43100
Brush		Exc.	Avg.
Gypsum Creek		Exc.	Avg.

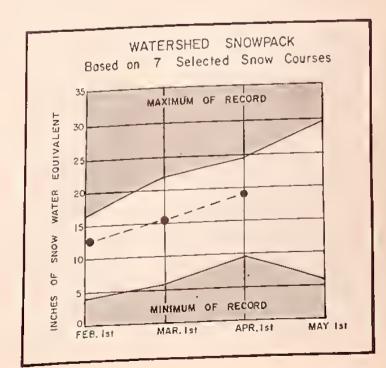


SUMMARY OF SHOW MEASUREMENTS

SUB-MATERSHED Blue River	Cou-tel Averaged	Last Year	1963-77 Average
Blue River			
DIGC MINTACT	7	82	114
Colorado	20	90	128
Plateau	3	92	148
Roaring Fork	8	102	128
Williams Fork	3	84	112
Willow	2	118	149

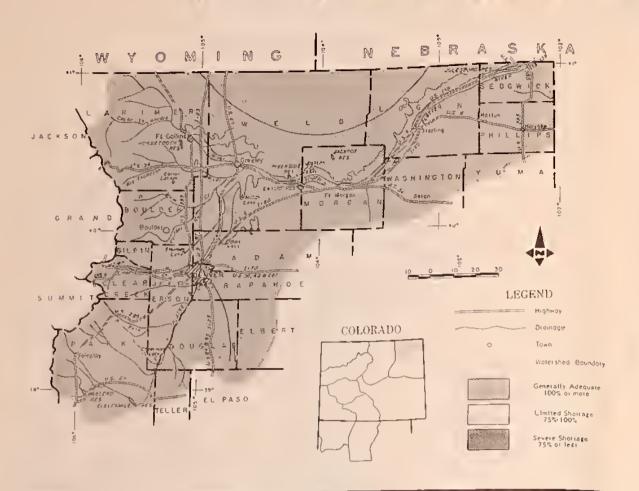
1		SNOW COURSE	DA	ŢE.	SNO	3W	WA	TER	WA1	IINCHI Ed CO	NYE!	NT	
		SHOW GORNAE	SUR	VEY	TINC	HE\$1	(INC	HESI	ر. ۲٤	AST EAR	61-	G.	
	B1	ORADO BASIN ue River flue River fremont Pass frisco Pass Grizzly Peak Hoosier Pass (B) Shrine Pass Snake River Summit Ranch olorado River Arrow Berthoud Pass Berthoud Summit Cooper Hill Copper Mountain Fiddler Gulch Glenmar Ranch Gore Pass Grand Lake Lake Irene Lapland Lulu	3 3 3 3 3 3 3 3 3	/26 /27 /27 /27 /26 /26 /27 /27 /27 /27 /23 /23 3/23 3/23 3/23	100 mm m m m m m m m m m m m m m m m m m	38 60 32 61 56 63 34 74 56 53 15 46 44 74 36 76	10 10 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7.7 7.7 8.5 9.0 7.7 9.4 7.7 8.5 11.4 22.8 10.0 113.0 224.4	2 2 1 2 1 1 1 1 2 2 1 1 1	33.1 33.4 	8 1 5 - 1 7 7 7 1 1 3 1 5 1 1 5 1 1 5 1 1 5 1 1 5 1 1 5 1 1 5 1	.00 .55 .80 .66 .60 .65 .55 .53 .88 .88 .88 .88 .88 .88 .88 .88 .88 .8	3377
		Lynx Pass McKenzie Gulch Middle Fork		-	26	48 34 38	3	14.3 9.	6 1	16.8	5 \ 3 \	2.6 5.	6 7
	1	Milner North Inlet Pando Phantom Valley Ranch Creek Tennessee Pass (Ute Pass Vail Mountain Vasquez	В)	333333333333333333333333333333333333333	25 26 26 126 3/2 3/2 /28 /28	38 6 6 8	2 3 45 48 48 38 81	13 1 1 1 2 6		5 17	.6\ .1 2.9 3.2	8 9 10	0.0
		Plateau Creek Mesa Lakes Park Reservoir Trickle Divide		3,	/26 /28 /29	10		22 34. 37	1	26. 37. 38.	5		.5
		Roaring Fork Aspen Independence Pass Ivanhoe Kiln Lift McClure Pass Nast North Lost Trail		3, 3, 3, 3, 3, 3,	28 26 26 26 28 27 27	7 6 4 7 5 3	4 5 8 9 4 8 1 6	17 23 21 14 21 21 21	.5 .2 .4 .7 .8	14 20 18 7	.7 .0 .3 .4 .2	17 18 12 17 15 6	.9 .4 .7 .4 .4
		Williams Fork Rive Glenmar Ranch Jones Pass Middle Fork	ŗ	3,	128 127 126	5	4 4 8	10 17 10	. 2	9 22 12		15	.6 .1 .7
		Willow Creek Granby Willow Creek Pass			28		5 8	11 17		9	.8	7 12	.3
								_	_	_	_		

HS-No survey. (B)-On adjacent drainage.



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				-বা
		0		

SOUTH PLATTE RIVER WATERSHED IN COLORADO



YOUR WATER SUPPLY

STORMS DURING THE LATTER PART OF MARCH AND FIRST WEEK IN APRIL HAVE IMPROVED THE SNOWPACK SUBSTANTIALLY OVER LAST MONTH. ALL STREAMFLOW FORECASTS HAVE BEEN RAISED ACCORDINGLY. STREAMFLOW FORECASTS RANGE FROM 104 PERCENT OF AVERAGE ON CLEAR CREEK TO 133 PERCENT OF NORMAL ON ST. VRAIN CREEK. HEADWATERS OF THE SOUTH PLATTE SHOULD FLOW ABOUT 105 PERCENT OF NORMAL. RESERVOIR STORAGE IN THE BASIN IS 96 PERCENT OF AVERAGE. SOIL MOISTURE 1S FAIR TO GOOD IN MOST AREAS. SOME INCREASES IN SNOWPACK CAN BE EXPECTED AT HIGHER ELEVATIONS DURING APRIL BUT LOWER ELEVATIONS WILL BEGIN MELTING.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Big Thompson River at Drake (1) Boulder Creek at Orodell Cache La Poudre River at Canyon Mouth (2) Clear Creek at Golden (3) St. Vrain Creek at Lyons Bear Creek at Morrison South Platte River at South Platte	125	123	102.0
	51	113	45.1
	292	120	243.0
	125	104	120.0
	95	133	71.6
	30	107	28.0
	203	105	193.0

(1) Observed flow plan by past to poor plants. (2) Observed flow since theory diversions plan surregal and irrigation diversions. (3) Observed flow since diversion through Access P. Gualis Tunnil.

	Flow Petiod		
STREAM OF AREA	Spling Season	Lore Sesson	
Coal Creek	Exc.	Avg.	
North Fork of South	Avg.	Fair	
Platte North Fork of Cache	Exc.	A * * * *	
La Poudre	Exc.	Avg.	
Ralston Creek	Exc.	Avg.	
Rock Creek	Exc.	Avg.	
South Platte from	Avg.	Avg.	
Greeley to Fort			
Morgan	A	77 - 1	
South Platte from	Avg.	Fair	
Fort Morgan to Sterling			
South Platte below	Avg.	Fair	
Sterling			



RESERVOIR	STORAGE	(Thousand	Ac. Ft.)	END OF MONTH
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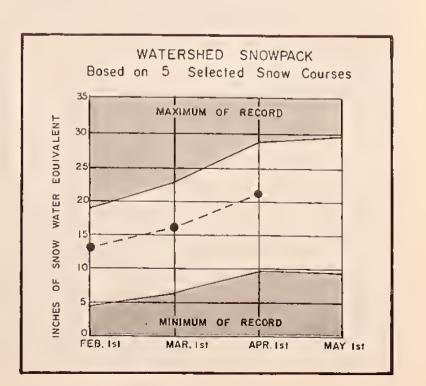
Batin or Stream	Urabh	U	imble Storage	
RESERVOIR	Capacity	Thes Fear	tat*	1963:77 Avelate
Antero	10	16	15	14
Barr Lake	16 32	22	20	25
Black Hollow	8	4	3	4
	44	37	16	37
Boyd Lake Cache La Poudre	10	9	7	8
Carter Lake	100	99	89	99
Chambers Lake	9	3	4	3
Cheesman	79	37	27	49
Cobb Lake	34	4	0	14
Eleven Mile	98	91	83	87
Empire	38	22	34	33
Fossil Creek	12	7	7	9
Gross	43	19	23	26
Halligan	6	5	4	5
Horsetooth	144	105	50	109
Jackson	35	33	34	34
Julesburg	28	23	23	22
Lake Loveland	14	8	9	10
Lone Tree	9	3	6	6
Mariano	5	5	5	5
Marshall	10	4	2	5
Marston	17	16	16	15
Milton	24	15	13	15
Point of Rocks	70	70	67	66
Prewitt	33	27	12	23
Riverside	58	55	46	59
Standley	42	31	22	25
Terry	8	6	6	5
Union	13	12	10	10
Windsor	19	12	8	12

SUMMARY of SNOW MEASUREMENTS

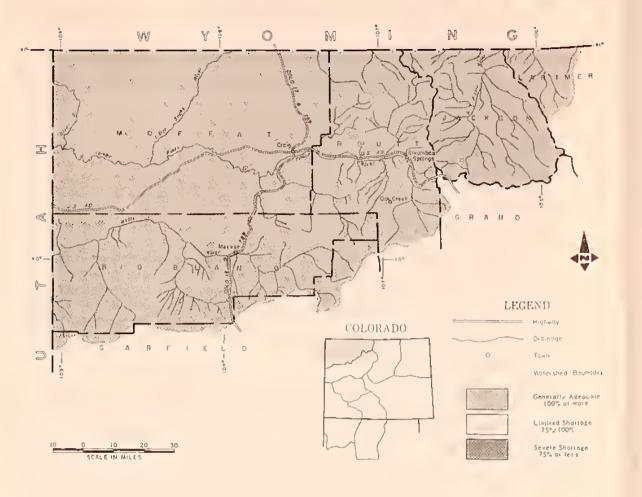
RIVER BASIN and or SUB-WATERSHEO	Numbee al Courses	THIS YEAR'S SNOW WATER AS PERCENT OF		
	Averaged	Latt Year	1963-77 Average	
Big Thompson	5	105	138	
Boulder	3	97	118	
Cache La Poudre	9	105	128	
Clear Creek	5	85	114	
Saint Vrain	3	121	165	
South Platte	7	141	144	

SHOW COURSE MEASUREMENTS

SNOW COURSE	OATE	SNOW OEPTH (INCHES)	WATER CONTENT (INCHES)	WATER CO	NTERT ES)
	SURVEY	(INCHES)	(INCHES)	LAST YEAR	AVG. 61-77
SOUTH PLATTE BASIN Boulder Creek					
Baltimore Boulder Falls Lake Eldora University Camp	3/26 3/29 3/26 3/29	31 46 47 57	9.4 14.2 12.5 19.3	7.2 15.1 13.5 22.0	6.6 12.3 17.0
Big Thompson River Bear Lake Deer Ridge Hidden Valley Lake Irene (B) Long's Peak Two Mile Willow Park	3/27 3/26 3/26 3/25 3/28 3/26 3/31	66 26 46 74 56 60 84	21.2 7.6 13.7 24.4 16.0 17.6 24.2	21.1 4.7 10.2 29.6 13.4 17.8 23.5	4.3 9.3 19.7 10.4 13.7
Cache La Poudre Bennett Creek Big South Cameron Pass Chambers Lake Deadman Hill Hourglass Lake Joe Wright Lost Lake Red Feather	3/26 3/27 3/27 3/27 3/26 3/26 3/27 3/27 3/27	43 17 83 38 64 40 80 47 40	11.3 4.6 30.9 13.2 19.3 9.7 25.6 14.6 11.3	6.5 1.6 32.0 13.1 21.2 8.8 29.2 14.8 7.3	6.6 1.3 28.2 9.0 15.5 6.7 24.4 11.1
Clear Creek Baltimore (B) Berthoud Falls Empire Grizzly Peak (B) Loveland Lift Loveland Pass	3/26 3/26 3/26 3/27 Discor 3/27	31 49 34 61 atinued	9.4 13.4 10.2 19.0	7.2 15.6 8.3 27.5 22.1	6.6 13.2 7.5 17.8 15.2
St. Vrain River Copeland Lake Ward Wild Basin	3/24 3/26 3/24	30 34 56	7.2 8.8 16.4	5.0 7.0 14.8	4.0 5.7 9.9
South Platte River Bison Reservoir Como Geneva Park Horseshoe Mountain Hoosier Pass Jefferson Creek Mosquito Trout Creek Pass Niwot Ridge	3/30 3/27 3/28 3/27 3/26 3/29 3/26 3/29 4/02	26 32 21 54 56 43 48 36 71	6.8 8.2 5.9 12.7 15.3 12.7 13.4 9.3	2.6 6.2 3.1 9.5 13.3 10.5 10.9 1.4	6.7 3.7 10.1 12.0 8.5 8.6 4.2
NS-No survey. (B)-On adjacent drainage.					



YAMPA, WHITE AND NORTH PLATTE RIVER WATERSHEDS IN COLORADO



YOUR WATER SUPPLY

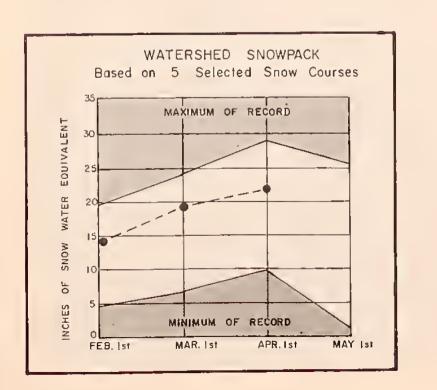
SNOWPACK INCREASES WERE SLIGHTLY ABOVE NORMAL ON THE YAMPA DURING MARCH. ACCUMULATIONS IN THE WHITE RIVER WATERSHED WERE SLIGHTLY BELOW NORMAL WHICH RESULTED 1N A DECREASE IN STREAMFLOW FORECASTS FROM 118 TO 111 PERCENT OF AVERAGE FLOWS SHOULD RANGE FROM 111 PERCENT OF NORMAL ON THE WHITE RIVER NEAR MEEKER TO 138 PERCENT ON THE LITTLE SNAKE AT LILY. SOIL MOISTURE CONDITIONS IN MOST OF THE AREA ARE GOOD AS A RESULT OF ABOVE AVERAGE ACCUMULATION OF SNOW AT LOW ELEVATIONS AND GOOD FALL PRECIPITATION.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Elk River at Clark	250	126	198.0
Laramie River near Woods	155	124	125.0
Little Snake River at Lily	480	138	349.0
North Platte River at Northgate	315	132	238.0
White River near Meeker	320	111	287.0
Yampa River near Maybell	1090	120	905.0
Yampa River at Steamboat Springs	320	117	273.0

WATER SUPPLY OUTLOOK Expedient With Respect to Usual Sugals

	Flow P	enod
STREAM OF AREA	Spring Seston	Late Season
Canadian River Hunt Creek Illinois River Michigan River Oak Creek Trout Creek	Exc. Exc. Exc. Exc. Exc.	Avg. Avg. Avg. Avg.
Trodt Greek	Exc.	Avg.



SUMMARY OF SHOW MEASUREMENTS

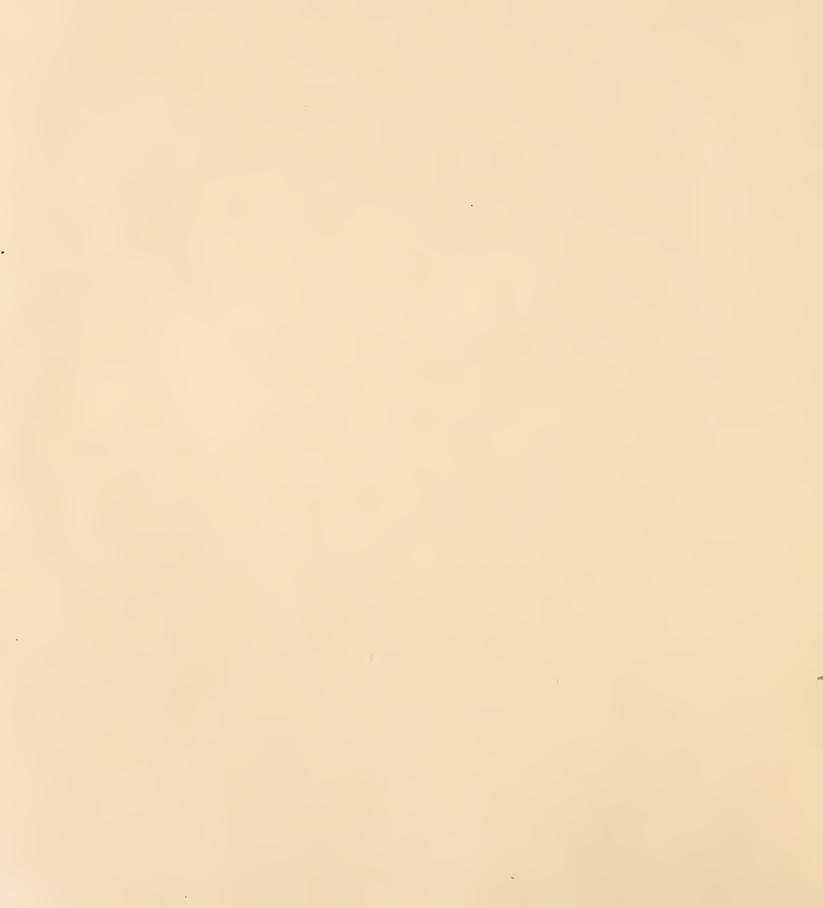
RIVER BASIN and ar SUB-MATERSHED	Number of Court es	THIS YEAR'S SHOW WATER AS PERCENT OF		
	Aveoged	Lait Yes	1963-77 A-1-19ge	
Elk	2	88	140	
Laramie	3	107	133	
North Platte	5	98	123	
White	2	77	116	
Yampa	8	80	122	

SNOW COURSE MEASUREMENTS

	CURRI	ENT INFORM	ATION	PAST PE	CORD
SNOW COURSE	SNOW COURSE OF SNOW OF CONTENT (INCHES)		WATER CO	_	
	SURVEY	INCHES)	(INCHES)	LAST YEAR	63-7
NORTH PLATTE BASIN					
Laramie River					
Deadman Hill	3/26	64	19.3	21.2	
McIntyre Roach	3/29 3/28	55 84	15.0	12.6	10. 18.
North Platte River					
Cameron Pass	3/27	83	30.9	32.0	
Columbine Lodge Northgate	3/29	72 33	27.2	34.9	23.
Park View	3/28	1	12.7	10.0	9.
Willow Cr. Pass (B)	3/28	58	17.9	14.8	12.
YAMPA BASIN					
Elk River					
Elk River Hahn's Peak	3/28	79 66	23.8	27.1	13.
White River					
Burro Mountain Rio Blanco	3/28 3/27		19.6 16.8	25.0	
Yampa River			1		
Bear River	3/27		13.3	1	
Columbine (B) Crosho	3/29		27.2	34.9	1
Dry Lake Lynx Pass (B)	3/2		25.5	1	
Rabbit Ears	3/2		28.8		
Tower Yampa View	3/2	1	57.1	1	
rampa view	3/28	8 53	19.5	21.3	2 14

(B)-On adjacent drainage.





Woter Supply Outlook for Colorodo and New Mexico - Poge 7 RIO GRANDE WATERSHED IN COLORADO AND NEW MEXICO

ARKANSAS RIVER WATERSHED IN COLORADO



YOUR WATER SUPPLY

MARCH BROUGHT ABOVE NORMAL PRECIPITATION TO MOST PORTIONS OF THE ARKANSAS RIVER HEADWATERS. THE ONLY EXCEPTION WAS THE PURGATOIRE RIVER. FORECASTS GENERALLY WERE RAISED SLIGHTLY FROM LAST MONTH AND NOW RANGE FROM 130 PERCENT OF NDRMAL DN THE PURGATDIRE TO 164 PERCENT OF AVERAGE DN THE HUERFANO RIVER. THE ARKANSAS IS PREDICTED TO FLOW 45 PERCENT ABOVE NORMAL. RESERVOIR STORAGE REMAINS DNLY 37 PERCENT OF NORMAL BUT THE ANTICIPATED HEAVY RUNOFF SHOULD RESULT IN A PARTIAL RECOVERY OF THE LAST FEW YEARS DRAWDOWN.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

FORECAST POINT	Folecast	% of Average	1963-77 Average
Arkansas River near Pueblo (1) Arkansas River at Salida (2) Cucharas River near La Veta Huerfano River near Redwing Purgatoire River at Trinidad (3)	377	145	260.D
	374	130	288.0
	12	134	9.1
	22	164	13,4
	43	130	32.8

RESERVOIR	STORAGE	(Thousand	Ac. Ft.)	END OF MONTH

Baein of Stramm	Urable	Veable Stotage		
RESERVOIR	Capacity	Thie	l, at 1 U at 1	1963:77 Avatoge
Adobe	62	0	0	7.0
		U	U	12
Clear Creek	11	2	4	7
Cucharas	40	0	0	1
Great Plains	150	0	0	43
Horse Creek	27	21	0	5
John Martin	621	14	6	59
Meredith	42	0	0	10
Model	15	0	0	2
Pueblo	351	39	2	-
Turquoise	121	72	47	30
Twin Lakes	58	16	20	26

	Flow P	FIRE
STREAM OF AREA	Spling Season	Lati
pishapa River	Exc.	Avg.
ountain Creek	Exc.	Avg.
rape Creek	Exc.	Avg.
lardscrabble Creek	Exc.	Avg.
onument Creek	Exc.	Avg.



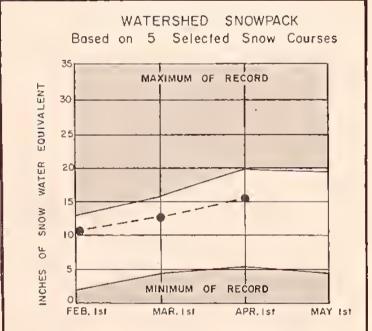


SUMMARY of SNOW MEASUREMENTS

RIVER BASIN	Number of Courses	THIS YEAR'S SNOW WATER AS PERCENT OF		
SUB-WATERSHED	Averagid	Loci Year	1963-77 Average	
Arkansas	11	119	138	
Cucharas	2	150	149	
Purgatoire	1	129	128	
Purgatoire	1	129	128	
			}	

10W COURSE MEASUREMENTS	CUAR	ENT INFORM	MITTON	PAST R	ECORD
SNOW COURSE	DATE OF SURVEY	SNOW OEPTH (INCHES)	WATER CONTENT (INCHES)	WATER CO (INCH LAST YEAR	AVG 53-77
ARKANSAS BASIN Arkansas River Bigelow Divide	3/27	39	9.6	4.1	7.:
Brumley Cooper Hill (B) East Fork Four Mile Park Fremont Pass Garfield Hermit Lake Monarch Pass South Colony Tennessee Pass	Disco 3/26 3/27 3/26 3/27 3/28 3/28 3/28 3/28	36 60 54 42 60 98	12.8 10.0 8.4 16.6 18.4 14.8 21.0 38.8 14.0	13.0 5.6 23.4 13.6 7.5 19.3	10.8 9.1 5.1 15.1 12.8 8. 16.
Twin Lakes Tunnel Westcliffe Cucharas River Apishapa	3/28 3/28 3/27	60	17.0 13.0	11.4 5.0	9.6 6.
Cucharas Creek La Veta Pass (B) Purgatoire River Bourbon	3/27 3/28	39 44	10.0	8.3	8.
Whiskey Creek	3/26 NS	34	8.8	6.8	6.

NS-No survey. (B)-On adjacent drainage.





COLORADO

Platoro Rio Grande

Sanchez Santa Maria

Terrace

Conchas

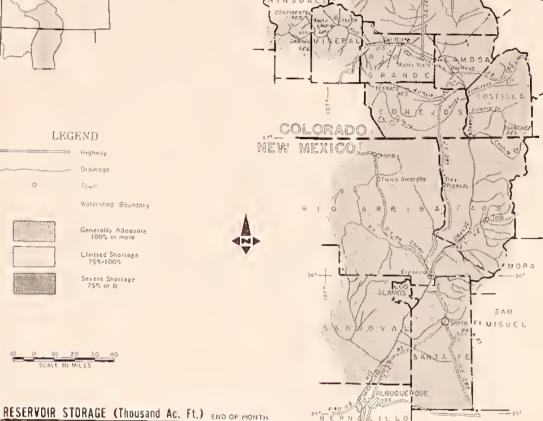
El Vado

McMillan

NEW MEXICO Avalon Caballo

Continental

COLORADO



WATER SUPPLY OUTLOOK Experies de Poor Fair Average. E.

Exc. Sangre de Cristo Cr. Exc. Exc . Trinchera Creek Exc. Embudo Creek Exc. Mora River Exc. Nambe Creek Exc. Exc. Rio Djo Caliante Exc. Exc. Rio Pueblo de Taos Exc. Екс. Santa Fe Creek

YOUR WATER SUPPLY

EXTREMELY HEAVY SNOWPACK EXISTS IN THE RID GRANDE BASIN IN BDTH COLDRADO AND NEW MEXICO. LDW ELEVATION SNOWPACK REMAINS AT ALMOST 300 PERCENT DF NDRMAL IN THE HEADWATERS OF THE RID GRANDE IN COLORADO. AT HIGH ELEVATIONS IN BOTH STATES THE SNOWPACK IS NEAR 200 PERCENT OF NDRMAL. SNOWPACKS DF THIS MAGNITUDE ARE COMPARABLE TO 1941, 1965 AND 1973 WHEN EXTREMELY HIGH RUNDFF WAS EXPERIENCED. THE POTENTIAL FOR FLOODING THIS YEAR, HOWEVER, IS HIGHER THAN IN THE PREVIOUS FDRECAST AT ABOUT TWO TIMES THE NORMAL FLOW. IF ABOVE NDRMAL PRECIPITATION AND INCREASES IN SNOWPACK WATER CONTENT OCCUR DURING APRIL, RECORD STREAMFLOWS WILL BE LIKELY. RESERVDIR STORAGE IS SLIGHTLY BELOW NDRMAL IN BDTH COLORADO AND NEW MEXICO BUT ALL RESERVOIRS SHOULD FILL.

STREAMFLOW FORECASTS (1000 Ac. Ft.)

FORECAST POINT	Forecast	% of Average	1963-77 Average
CDLORADO (April-September) Alamosa Creek above Terrace Reservoir Conejos River near Mogote (1) Culebra Creek at San Luis (2) Rio Grande at 30 Mile Bridge (3) Rio Grande near Del Norte (3) South Fork of Rio Grande at South Fork NEW MEXICD (March-July) Costilla Creek at Costilla (4) Jemez River near Jemez Pecos River at Pecos Red River at Mouth near Questa Rio Chama at El Vado Rio Grande at Otowi (5)	125 320 40 232 900 226 40 75 105 50 390 1400	197 175 261 195 195 190 259 225 276 185 220 282	
Rio Grande at San Marcial (5) Rio Hondo near Valdez Santa Cruz River at Cundiyo	12D0 22 24	358 175 207	335.0 12.8 11.6

SUMMARY of SNOW MEASUREMENTS

Elephant Butte 2195 308

RIVER BASIN	Number of Courses	THIS YEAR'S SHOW WATER AS PERCENT OF		
SUB-WATERSHED	Averaged	Latt Yest	1963-17 Averag	
COLORADD				
Alamosa	1	394	265	
Conejos	5	143	174	
Culebra	3	147	21.4	
Rio Grande, CD	12	230	213	

195 52

23 48

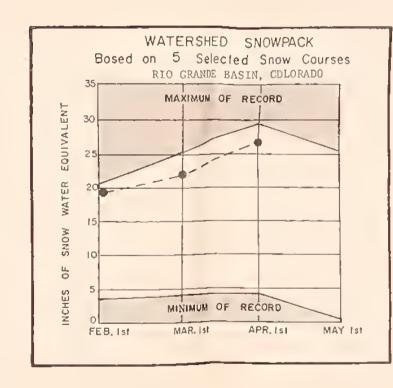
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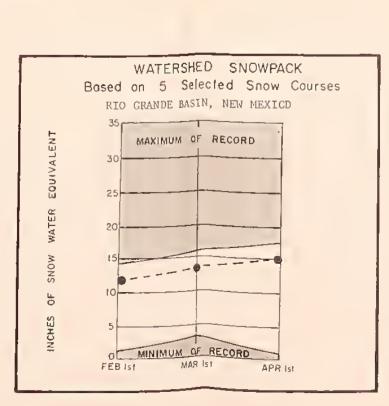
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WORZ	COURSE	MEASUREMENTS	

		_			
SNOW COURSE	DATE	SNOW	WATER	WATER CO	ONTEUT (ES)
	SURVEY	DEPTH (INCHES)	CONTENT (INCHES)	LAST YEAR	AVG. 93-77
RIO GRANDE BASIN-COLO.					
Alamosa River	1	1			
Silver Lakes	3/26	39	13.8	3.5	5.2
Conejos River	3,20	1	15.0]	7.2
Cumbres Pass Cumbres Trestle La Manga Platoro River Springs Pinos Mill Culebra River	3/27 3/27 3/27 3/26 3/28 3/29	26	29.3 41.9 32.3 25.3 7.6 33.5	32.5 18.7 13.5 0.7	18.5 21.2 18.3 15.8 4.4
Brown Cabin Cottonwood (B) Culebra La Veta Pass (B) Trinchera (B) Rio Grande	3/27 NS 3/28 3/28 3/27	47 53 44 44	15.7 15,9 14.1 12.8	15.3 7.7	4.8 8.5 8.1 8.5
Big Meadows Cochetopa Pass Grayback Hiway Lake Humphrey Love Lake Middle Creek Pass Creek Piedra Peak Pool Table Porcupine Santa Maria	3/29 3/27 3/28	38 80 118 71 73 111 76 ontinue 57 73 46	13.9 22.9 12.8	5.4 11.1 23.8 4.3 9.2 9.7 3.0 7.9 3.4	5.9 14.9 23.7 6.3 9.2 10.5 5.2 9.4 3.6
Upper Rio Grande Wolf Creek Pass Wolf Cr. Summit (B)	3/26 3/28 3/27	73	21.6	7.1 26.6	7.3 25.8 28.4





SUMMARY OF SHOW MEASUREMENTS

RIVER BASIN	Humber of Coulter		R'S SNOW PERCENT OF
SUDWATERSHED	Pelleliny	Latt Tans	1963-77 Average
NEW MEXICD			
Pecos Red River Rio Chama Rio Grande, NM Rio Hondo	1 2 3 14 1	400 160 123 156 166	4D0 250 201 192

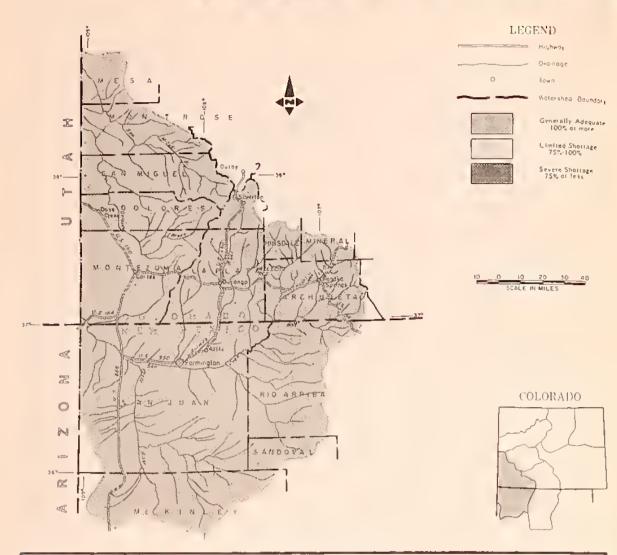
SKOW COURSE MEASUREMENTS

SNOW COURSE		WATER	PTH CONTENT		(ES)	Ĺ
	SURVEY	INCHEST	CONTENT	LAST	AVG. 63-77	
RIO GRANDE BASIN - NM						
Pecos River						
Panchuela	3/30	22	8.0	2.0	2.0	
	2,30		0,0	2.0	2.0	
Red River						
Hematite Park (B) Red River	3/29	33 37	8.5	5.0 7.2	3.6	
	3/20	31	11.0	1.2	5.2	
Rio Chama						
Bateman	3/26	52	18.3	17.4	11.3	
Chama Divide Chamita	3/27	19 45	7.1	3.9	7.2	
	3,20	7,5	13.6	11.0	,,2	
Rio Grande						
Alamitos Bernal Trail (B)	3/29	24 38	7.5	5.0	4.9	
Big Tesuque	3/27	27	9.1	6.8	4.5	
Cordova	3/28	48	16.0	10.1	10.0	
Elk Cabin	3/29	1.5	3.9	2.1	2.5	
Gallegos Peak Hopewell	3/30	43 71	14.8	9.8 18.2	15.7	
La Cueva	3/30	33	11.6	7.3	5.2	
North Costilla	3/27	37	11.0	7.0		
Palo Payrole	3/28	31 57	9,6	15.0	6.6	
Quemazon	3/27	55	17.6	7.6	8.5	
Rio En Medio	3/29	47	15.9	11.8	8.3	
Sandoval Senorita Divide	3/27	36 35	11.7	4.3 9.8	5.1	
Taos Canyon	3/28	25	8.3	5.1	4.2	
Tres Ritos	3/30	24	7.4	4.4	4.7	
Rio Hondo						
Taos Powderhorn	3/27	110	43.7	26.3		

NS-No survey.
(8)-On adjacent drainage.

NS-No survey. (B)-On adjacent drainage.

SAN MIGUEL, DOLORES, ANIMAS AND SAN JUAN WATERSHEDS IN COLORADO AND NEW MEXICO



YOUR WATER SUPPLY

ABOVE NORMAL PRECIPITATION FOR THE FIFTH STRAIGHT MONTH INCREASED THE SNOWPACK TO RECORD LEVELS. HIGH ELEVATION SNOWPACK IS AT OR NEAR THE RECORD LEVELS SET IN 1952. LOW ELEVATION SNOWPACK EXCEEDS ALL PREVIOUS MEASUREMENTS SINCE 1935. SNOTEL DATA SHOWS ONE TO TWO ADDITIONAL INCHES OF PRECIPITATION SINCE THIS MONTH'S MANUAL SURVEYS. EXCELLENT SOIL MOISTURE COMBINED WITH THE RECORD SNOWPACK SHOULD PRODUCE FLOWS FROM 170 TO 230 PERCENT OF NORMAL. FLOOD POTENTIAL REMAINS HIGH FOR LOW LYING AREAS ONCE THE MAJOR MELT SEQUENCE BEGINS.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Animas River at Durango Dolores River at Dolores La Plata River at Hesperus Los Pinos River at Bayfield (1) Mancos River near Towac (2) Inflow to Navajo River (1 & 3) Piedra Creek at Arboles San Juan River at Carracas San Miguel River at Placerville	780	184	425.0
	430	185	233.0
	45	191	23.5
	360	176	204.0
	50	228	21.9
	1450	238	608.0
	450	224	201.0
	760	205	370.0
	210	169	124.0

(1) Observed flow plus change in storage in Vallicity Reservoir. (2) Watch-July. (3) April-July.

WATER SUPPLY OUTLOOK E-pressed as "Poor, Faw, Average, E-

THE	on with Respec	to osoal supply
	Fło≈ F	'eriod
STREAM OF AREA	Spring Season	Late Season
Florida River Hermosa Creek West Dolores River Williams Creek	Exc. Exc. Exc. Exc.	Exc. Exc. Exc. Exc.

RESERVOIR STORAGE (Thousand Ac. Ft.) END OF MONTH

RESERVOIR STORAGE (THOUSAND NO. 11) ENG OF FORTH							
Basin or Stream and/or RESERVOIR	Usable Capacely	Usable Slorage					
		This	1 a31	1963-77 Average			
Groundhog Jackson Gulch Lemon Navajo Vallecito	22 10 40 1696 126	9 2 8 1180 42	7 4 5 959 25	10 5 19 692 59			
	1						

SUMMARY of SNOW MEASUREMENTS

SHOW COURSE MEASUREMENTS	CURRENT INFORMATION			PAST RECORD	
SNOW COURSE	DATE DE SURVEY (SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	MATER CONTENT	
				TEAR	6J-7
SAN JUAN-DOLORES BASIN					
Animas River					
Cascade	3/28	83	27.5	15.3	10.
Lemon	3/27	67	22.9	10.9	8.
Mineral Creek	3/26		22.7		15.
Molas Lake	3/26	63	20.6		12.
Purgatory	3/28		45.0	1	18.
Red Mt. Pass (B)	3/26		44.0		29.
Silverton Sub-Sta.	3/26		15.1	10.6	6.
Spud Mountain	3/26	121	49.9	28.8	22.
Dolores River					
Croundhog Lizard Head	3/29 3/26	57 83	20.1	17.8 23.2	16.
			23.8	21.2	15.
Lone Cone	3/29	1	22.9	21.2	15.
Ophir Loop	3/26	1	12.0	10.4	6.

3/27

3/28

3/28

3/27

3/27

3/28

3/27

3/28

3/28

44

45

139

118

137

13.2

3.9

11.6

23.8

22.3 14.1

35.6 28.

26.6 25.

27.5 28.

7.1

13.0

7.1

15.2

55.0

48.5

52.3

32.4

30.0 25.0

NS-No survey. (B)-On adjacent drainage.

Snow Spur

Telluride

Trout Lake Houser Camp

Chamita (B)

San Juan River

Chama Divide (B)

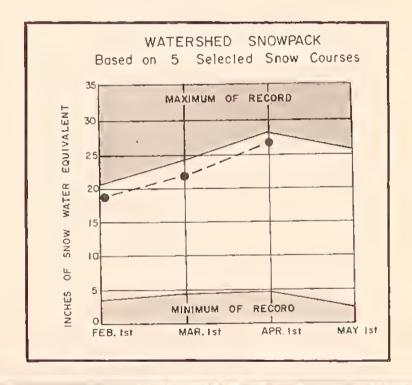
Wolf Cr. Pass (B)

Wolf Cr. Summit

Mancos T-Down

La Plata

Upper San Juan



WATER SUPPLY OUTLOOK BY MAJOR WATERSHED AREAS

-GUNNISON RIVER WATERSHED

Describes water supply canditions in Delta, Gunnison, Cimarron, Shovono, and Uncompangre Soil Conservation Districts.

-COLORADO RIVER WATERSHED

Describes water supply conditions in DeBeque, Ploteou Volley, Lower Grand Valley, Bookcliff, Eagle County, Middle Park, Glade Park, Upper Grand Valley, South Side, and Mt. Sopris Soil Conservation Districts.

-SOUTH PLATTE RIVER WATERSHED

Describes water supply conditions in Fart Collins, 8ig Thompson, Langmont, 8aulder Valley, Jefferson, Teller-Pork, Douglas County, Morgan, Kiawa, West Arapahoe, West Adams, East Adams, Plotte Valley, Southeast Weld, and West Greeley Soil Conservation Districts. Also describes water supply conditions in Sedgwick, South Plotte, Hoxton, Peetz, Padroni, Morgan, Rock Creek, and Yumo Soil Conservation Districts.

-YAMPA, WHITE AND NORTH PLATTE RIVERS WATERSHED

Describes water supply conditions in Yompa, Moffot, West Routt, Eost Routt, North Park, White River, and Douglos Creek Sail Conservation Districts.

-ARKANSAS RIVER WATERSHED

Describes water supply conditions in Lake County, Upper Arkansos, Fremont, Custer County Divide, Fountain Valley, Block Squirrel, Central Colorado, Turkey Creek, Pueblo, Bessemer, Olney Boone, Cheyenne, Upper Huerfana, Stonewall, Spanish Peaks, Purgataire, Branson Trinchera, Western Baca, Southeostern Baca, Two Buttes, Bent, Timpas, Northeost Prowers, Prowers, Kiowo County, West Otero, East Otero, Prairie, Hi Plains, and Double El Sail Conservation Districts.

-RIO GRANDE WATERSHED

Describes water supply conditions in Rio Grande, Center, Canejas, Masca Haaper, Mt. 8lonca, Sanchez, and Culebra Soil Conservation Districts. Also describes water supply conditions in Upper Chama, East Rio Arriba, Taos, Lindrith, Jemez, Santa Fe - Pajooque, Sondoval, Tijeras, Cuba, and Edgewood Sail Canservation Districts.

-DOLORES, SAN JUAN, AND ANIMAS RIVERS WATERSHED

Describes water supply canditions in San Miguel Basin, Dove Creek, Dolores, Mancos, LaPlata, Pine River, Son Juon, San Miguel Basin, and Glade Park Soil Conservation Districts.